A NATURAL BRIDGE DUE TO STREAM MEANDERING

V. H. BARNETT

Natural bridges were originally referred to the agency of caverns, as explained in Scott's *Geology*[1] and most of the less recent works. Scott gives the Natural Bridge of Virginia as an example of this method of formation, and it was not until 1893, when Walcott[2] described the bridge, that it was considered as having been formed in another way. Cleland[3] has reviewed several methods of origin in an article in the *American Journal of Science*, but so far as the writer knows none have ever been described as being due to stream meandering.

The bridge here described is located south of the White River below the mouth of Porcupine Creek, in South Dakota, and was visited by the writer in 1905, while working as field assistant to Professor E. S. Riggs, of the Field Columbian Museum. It is formed of White River beds. The opening of the archway is about 12 feet high by 8 feet wide, and the thickness of the arch is something like 10 feet in a vertical direction by 7 feet in a horizontal. The left side of the picture (Fig. 1) is the canyon wall, while on the right a pillar supports one end of the arch. The stream which formed this natural bridge once flowed on the outer side of the pillar, but making a sharp bend, it flowed just in front of the pillar to a point immediately under the near edge of the arch, where it turned and flowed along the foot of the wall toward the front of the picture. The position of this bridge is such that it was very difficult to photograph it so as to show its true relation to the stream. Between the foreground on the right, covered with weeds, and the pillar, one side of which only is shown, is the old channel of the stream. The gorge is about 30 feet deep,

[1] W. B. Scott, *An Introduction to Geology*, pp. 90, 91.

[2] *National Geographical Magazine*, Vol. V, 1893, p. 59.

[3] *American Journal of Science*, 4th ser., Vol. XX, 1905, pp. 119–24; 3 figs.

with almost vertical walls. The rock is a hard, rather blocky, light-blue clay, showing typical bad-land topography and weathering rather rapidly, though not as fast as the softer maroon clays of the Oreodon

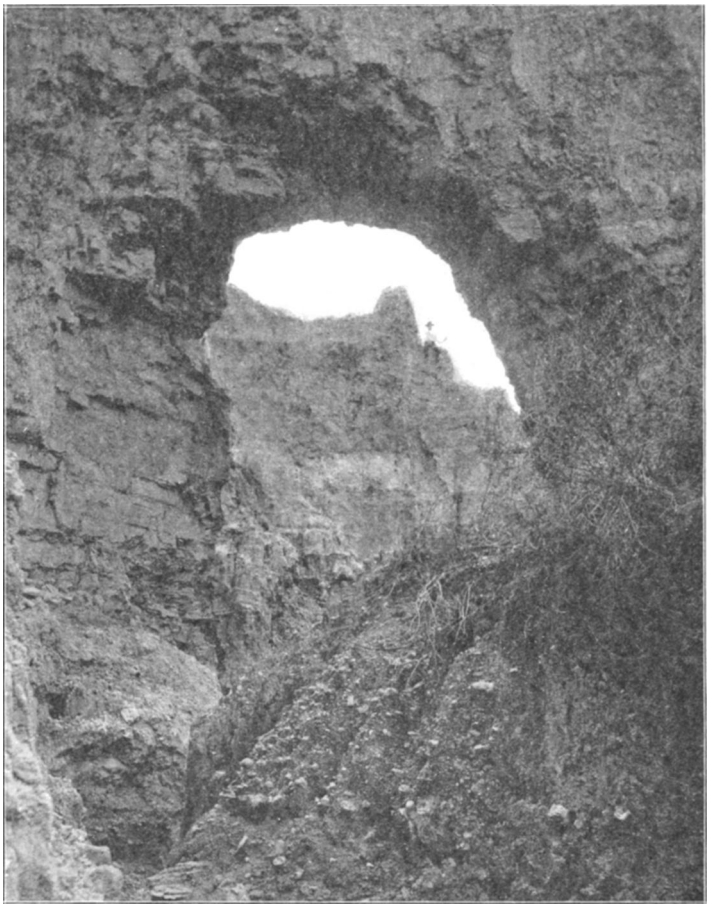

FIG. 1.—A natural bridge south of White River below mouth of Porcupine Creek, South Dakota.

beds. The bridge was formed in the following method: Flowing in the direction indicated by the arrows in Fig. 2, and taking the course of the dotted lines, the stream kept cutting in on the narrow ridge at

A from both sides, until it had eaten its way through, thus straightening its channel but leaving a pillar (*B*) supporting an arch over the stream.

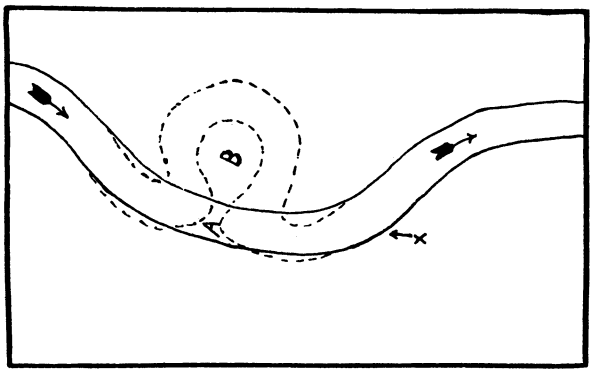

FIG. 2.—A drawing to illustrate the way in which the natural bridge was formed. The view (Fig. 1) was taken from a position indicated by the cross and looking in the direction of the arrow.